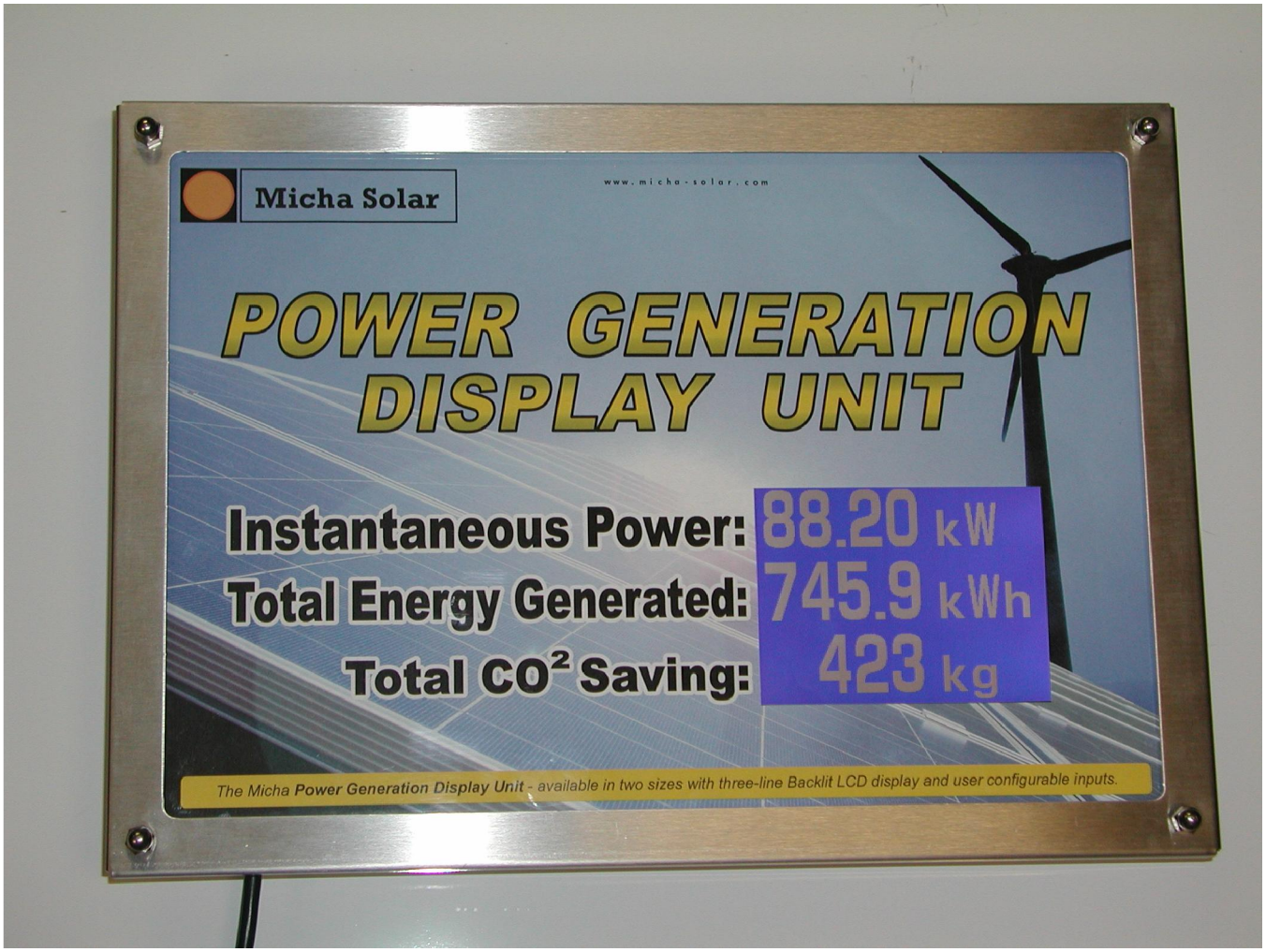
1. Introduction

The Power Generation Display Unit is designed to display the power generated by any Power Generation system but is usually used on a renewable energy generation site, e.g. Photovoltaic (PV) or Wind. For a PV system, PV panels would typically be installed on a building and provide power directly to the mains grid via inverters. Energy meters provide pulses to the Power Generation Display Unit to enable the energy generated to be counted and displayed.



The Power Generation Display Unit is available in two sizes as described in the following table:

Micha Part Number	Description	Graphic Size
101 820	Power Generation Display Unit	420mm wide x 300mm high (A3 Graphic Size)
101 640	Power Generation Display Unit	600mm wide x 500mm high

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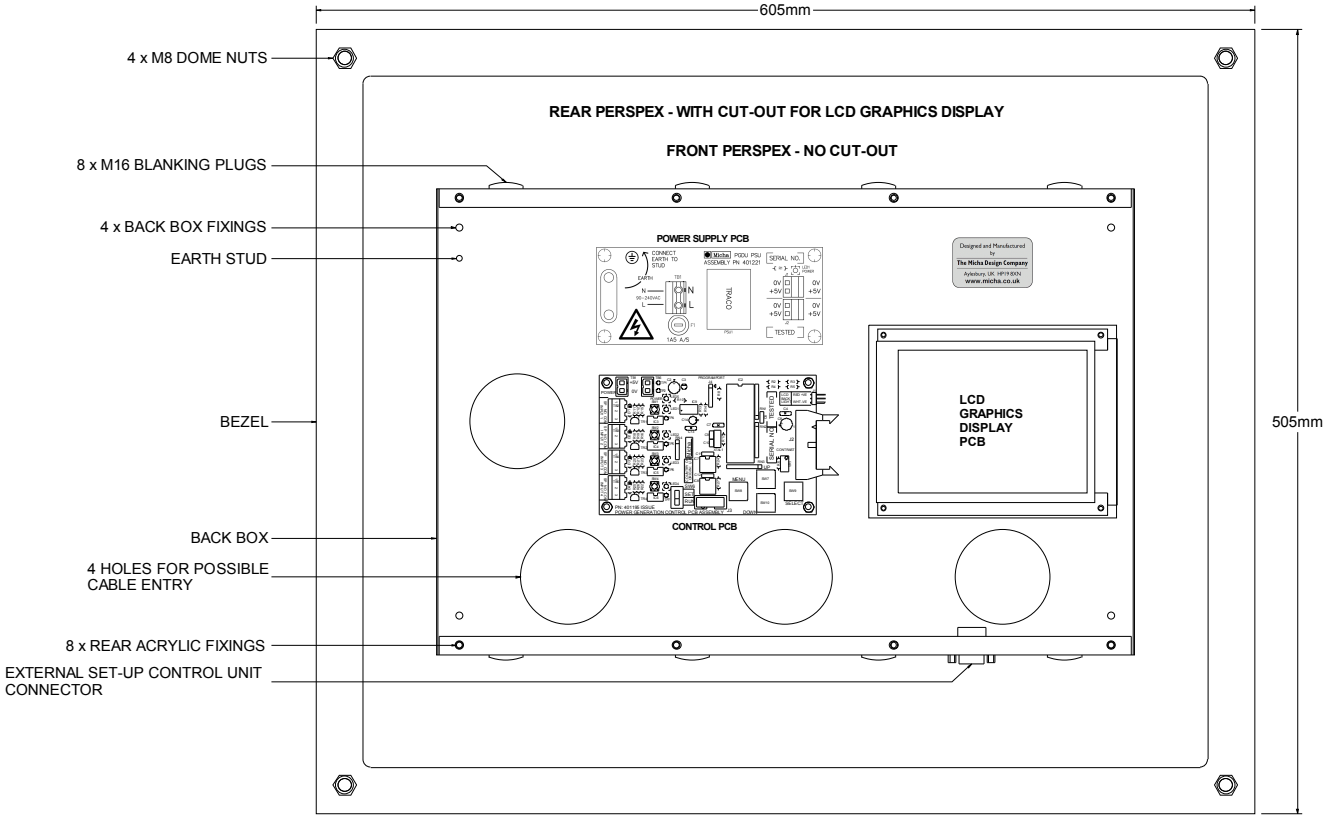
2. General Arrangement

The unit comprises a back-box which houses the Power Supply PCB, Control PCB and Display PCB Assemblies. The back-box is covered with two sheets of clear acrylic (420 x 300mm or 600 x 500mm) which are designed to trap a fixed graphic of the end users choice. The backlit LCD graphics display is visible through an aperture in the graphic. The sheets of acrylic are held together by the surrounding bezel and M8 fixings.



2.1. NOTE: LCD Display

When fully assembled, the LCD Display sits slightly proud of the metal back-box. For this reason the unit is supplied in parts which are typically assembled at installation time. The LCD Display should not be fitted to the four nylon pillars provided until the back-box has been fitted to the supporting wall – see section 3.4

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3. Installation

3.1. Disassembly

Carefully remove the four M8 fixings in the four corners of the bezel and remove the bezel.. If this is an existing installation, remove the tape which is applied to the edge of the two sheets of acrylic (this should be done carefully to avoid dropping the front sheet of acrylic). Remove the front sheet of acrylic and any graphic that is installed. Remove the eight M4 countersunk screws that hold the rear sheet of acrylic to the back box.

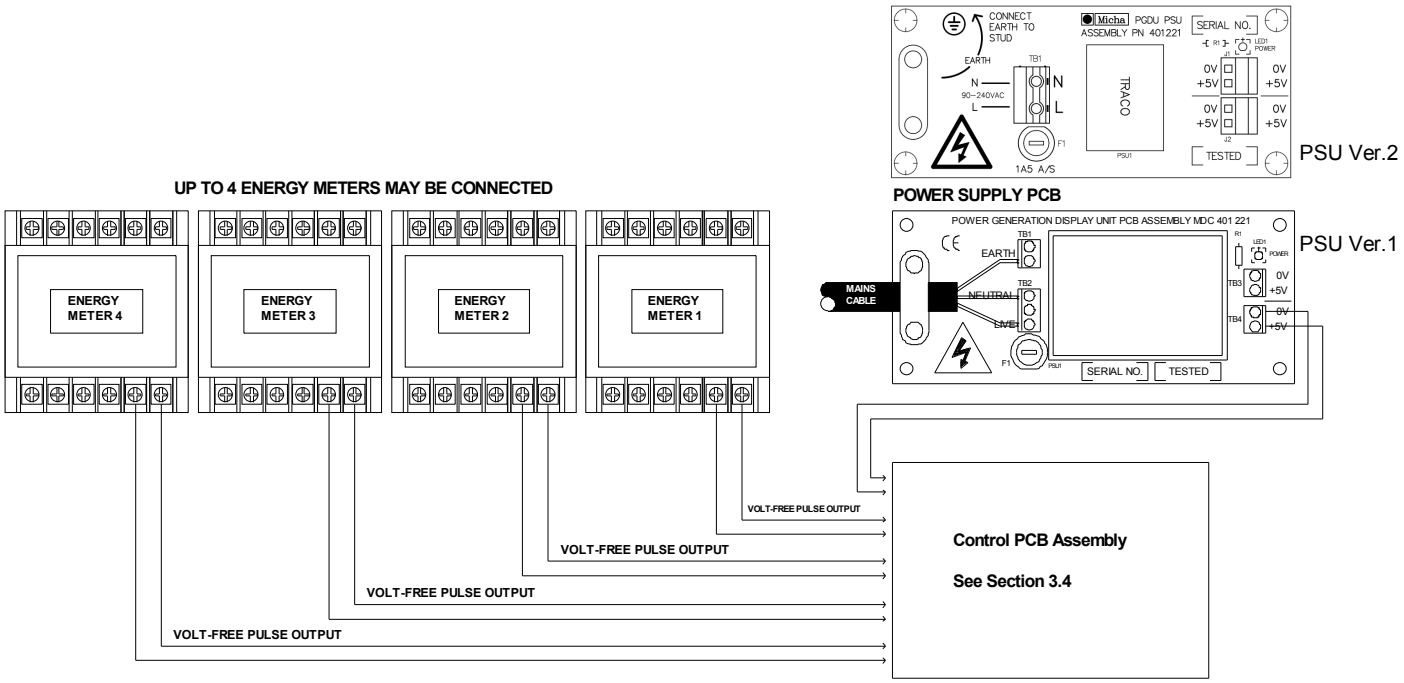
3.2. Installation of Back Box

Using the back box as a template, mark the position of the four mounting holes onto the desired location. Drill and fit rawl plugs or other suitable fixings to hold the back box to the wall. Fix the back box to the wall.

The unit requires mains power and the signal for the energy meter. These cables may be brought into the enclosure using the large holes on the back wall of the enclosure, or through any of the eight cable gland holes provided (remove the blanking plug and fit M16 glands as required).

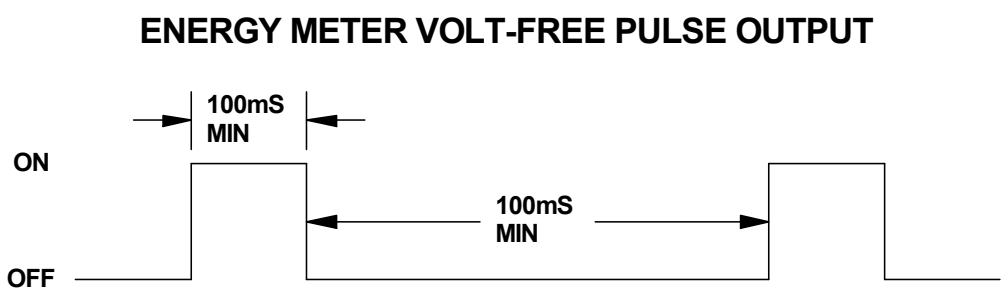
Connect the mains to the Power Supply PCB Assembly using the cable clamp arrangement provided and ensuring the connections are tight. **Note**: with Version 1 PSU, the Earth cable should be connected to the pcb terminal, on Version 2 PSU, the Earth cable should be connected directly to the earth stud on the back-box.

Connect the Volt-Free Pulse Output from up to four Energy Meters to the inputs marked Input 1-4 on the Control PCB Assembly. See diagram below and Section 3.4.



3.3. Energy Meter Pulse Output

The Unit is capable of sensing pulses that have an on and off time of at least 100ms. See diagram below.



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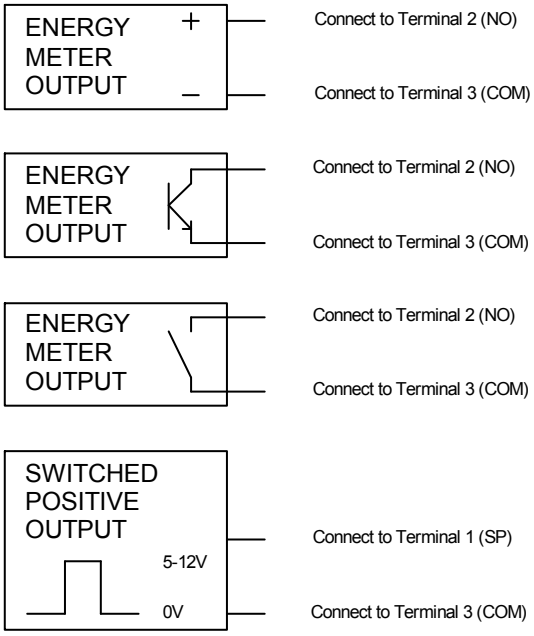
3.4. Control Printed Circuit Board (PCB)

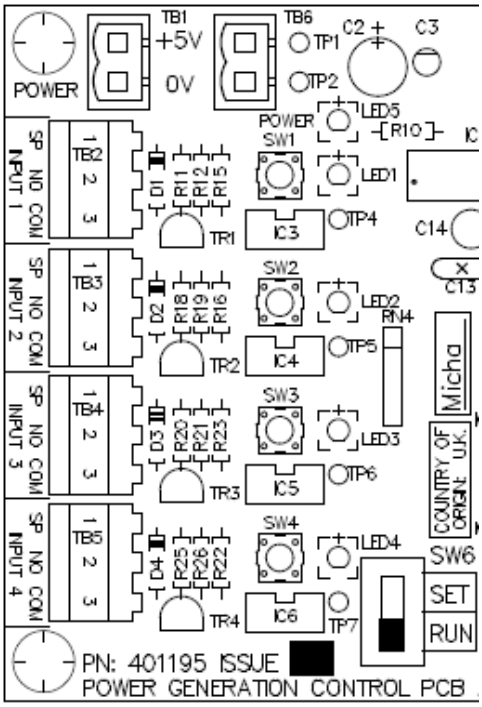
Control PCB Issue 4:

Connect any of the following Energy Meter Output Connections to any Control PCB Input 1, 2, 3 or 4:

(Energy Meters manufacturers mark the SO Pulse output in different ways)



Control PCB Issue 4 Layout: Up to 4 inputs can be connected



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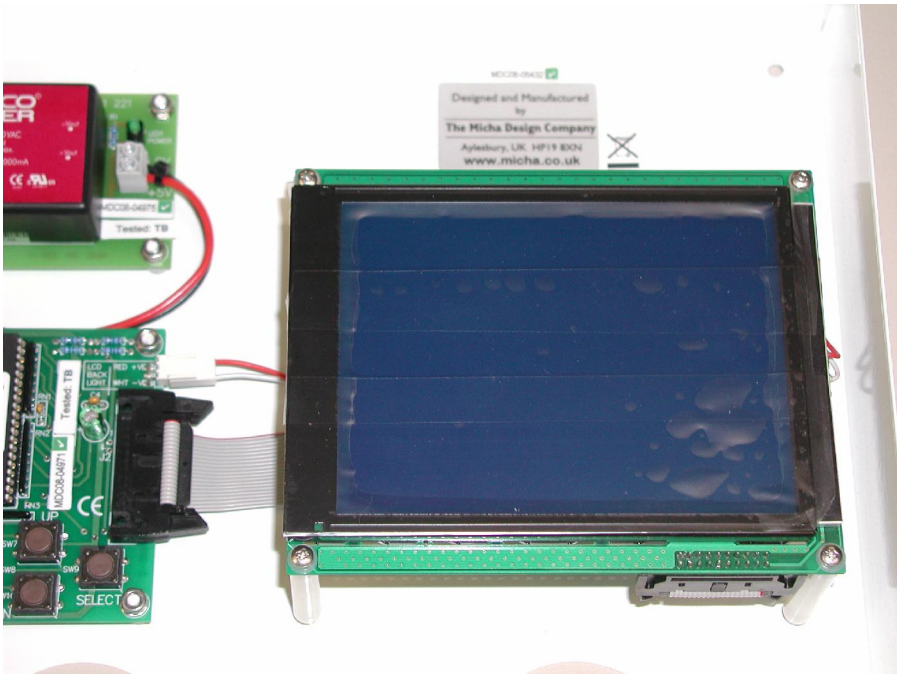
3.5. LCD Display Installation

After the back-box has been securely fitted to the supporting wall, unpack and carefully fit the LCD Display to the four nylon pillars using a pozi-screw and nylon washer (provided) on each corner of the LCD Display (do not over-tighten).

Plug the ribbon cable into the corresponding connector (J2) on the Control PCB and plug the back-light connector into its corresponding connector (J1).



Remove the protective plastic covering the LCD Display at this point (3 or 4 strips of plastic).

3.6. Set up

At this point, apply mains power to the unit. Set the Set/Run switch on the Control PCB Assembly to SET.

Use the Menu switch to advance through the following parameters in sequence (see photo below):

When a parameter is flashing, use the Up and Down switches to adjust.

When the unit is set to RUN, all parameters will be stored in non-volatile memory.

See section 3.8 regarding the External Set-up Control Unit.

3.6.1. Set Pulse Value

The Energy Meters produce pulses which represent Watt-hours (Wh) being generated. The unit needs to be programmed to set the Pulse Value in Wh. Also, if a number of identical systems are in place but only one of the systems has energy meters fitted, then the Pulse Value can be multiplied by 1 to 40 to enable the display to show the energy for the entire arrangement.

First set the number of systems (1 to 40) using the Up and Down switches.

Press Menu.

Now set the Pulse Value (1Wh, 10Wh, 100Wh, 1kWh, 10kWh per pulse).

Press Menu.

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3.6.2. Set Instant Power Time

The instantaneous power being generated is calculated by counting the number of pulses received over a period of time. This parameter should be set for a time that allows a number of pulses to be received (which depends on the size of the system and the pulses sent out by the energy meter).

The Instant Power Time interval can be set to 1, 2, 3, 5, 10, 12, 15, 20, 30 and 60 minutes. The instantaneous power generated will appear on the display after the time selected and then remain unchanged until the next update.

3.6.3. Set Total Energy

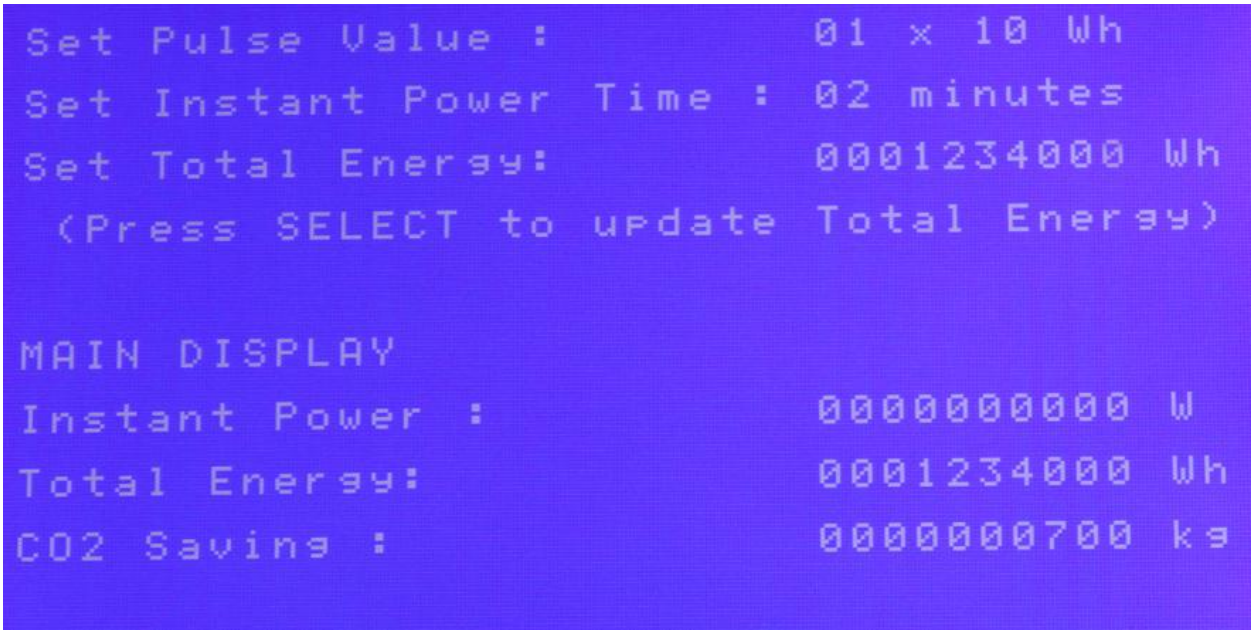
If a display unit is being installed after the system is up and running or as a replacement, it may be desired to enter the energy in Watt-hours (Wh) that has already been generated.

The installer may set the Total Energy as any 10-digit number representing Total Energy in Wh.

How to set Total Energy:

When any digit of this parameter is flashing, use the Up and Down switches to change the digit. Use the Menu switch to advance through all the digits. (The example below shows how to set 1234kWh)

Important: Press the SELECT switch to update the Set Total Energy figure.



3.6.4. Testing the unit

Each of the Pulse Inputs has a test switch associated with the input terminal connector. By pressing the test switches the installer may simulate pulses being received and see the results on the display.

3.7. Installation of Acrylic Sheets

Using the eight M4 countersunk screws, fix the rear sheet of acrylic to the back box.

Place the graphic and the front sheet of acrylic onto the rear sheet of acrylic and temporarily fix them together using the top two M8 fixings.

Apply clear self-adhesive tape all the way round the edges of the two acrylic sheets to seal the two together. This is important as it can prevent small insects or moisture getting between the two sheets and affecting the appearance of the graphic and display.

Using the four M8 fixings, fix the bezel in place (note that the front sheet will only be held in place by the adhesive tape if the top two fixings are removed and the sheet is not supported). The four M8 fixings should be inserted from the rear and the dome top nut used to secure the front.

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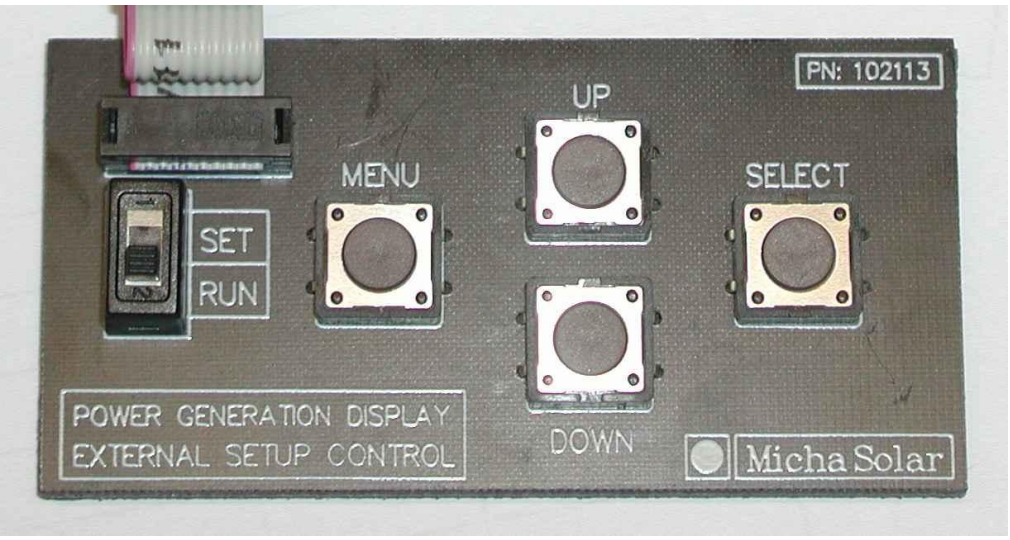
3.8. External Set-up Control Unit

Units produced after June 2010 have the facility to connect an External Set-up Control Unit via a 9-way D-type connector on the bottom side surface of the unit. The External Set-up Control Unit has the same switches as the Main Control PCB and works in the same way. It allows changes to be made without disassembling the unit.

External Set-up Control Unit:



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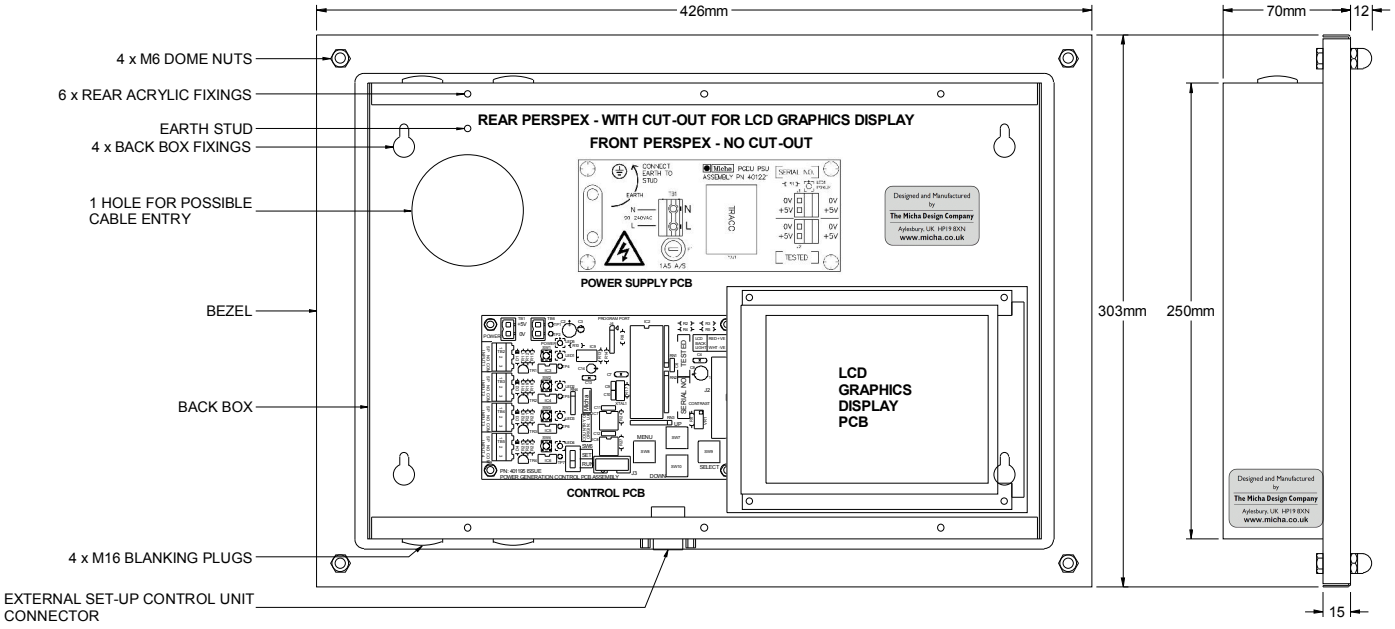
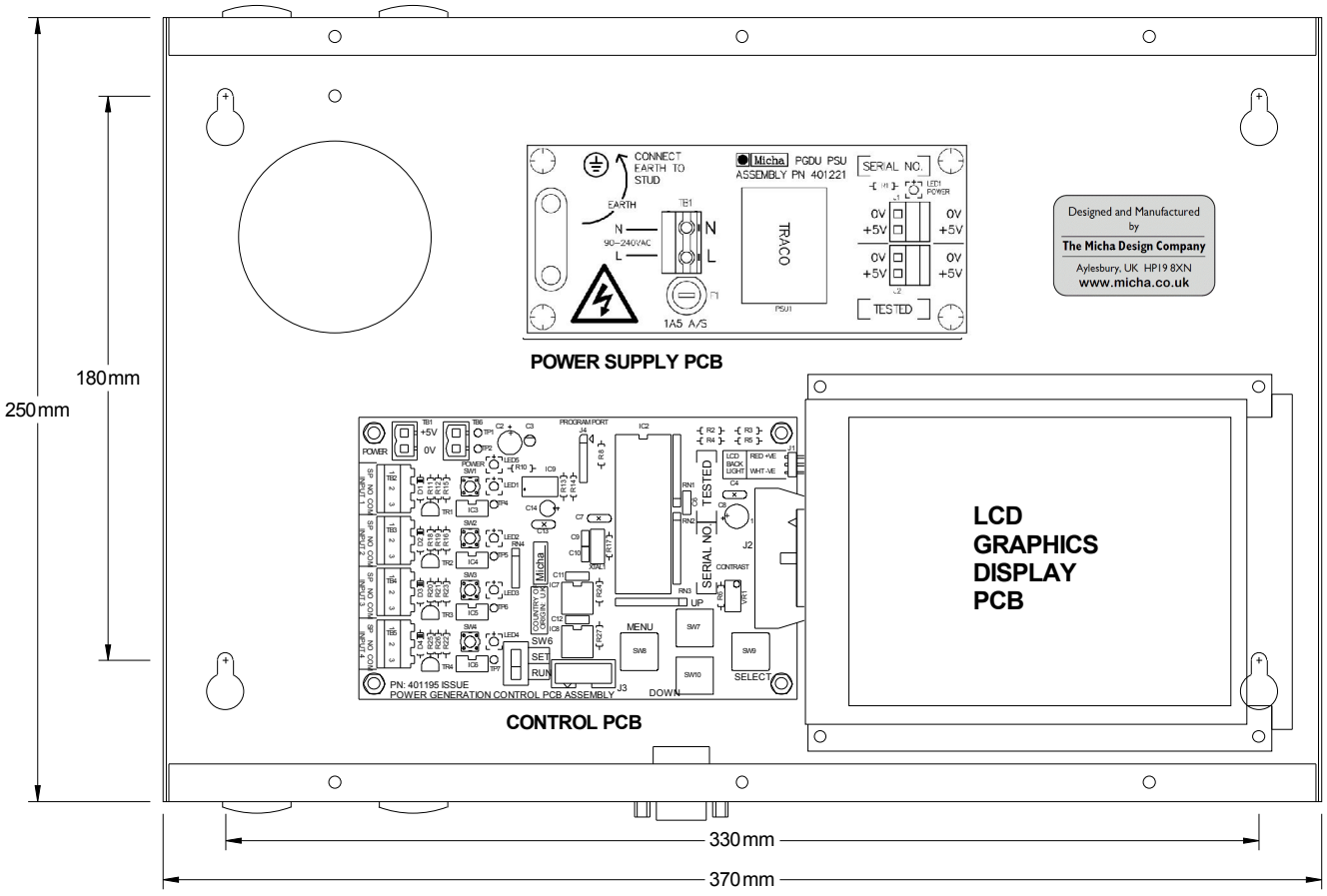
4. Drawings

4.1. Power Generation Display Unit - 42 x 30cm (A3) – General Arrangement



4.2. Power Generation Display Unit - 42 x 30cm (A3) – Back Box Mounting Details



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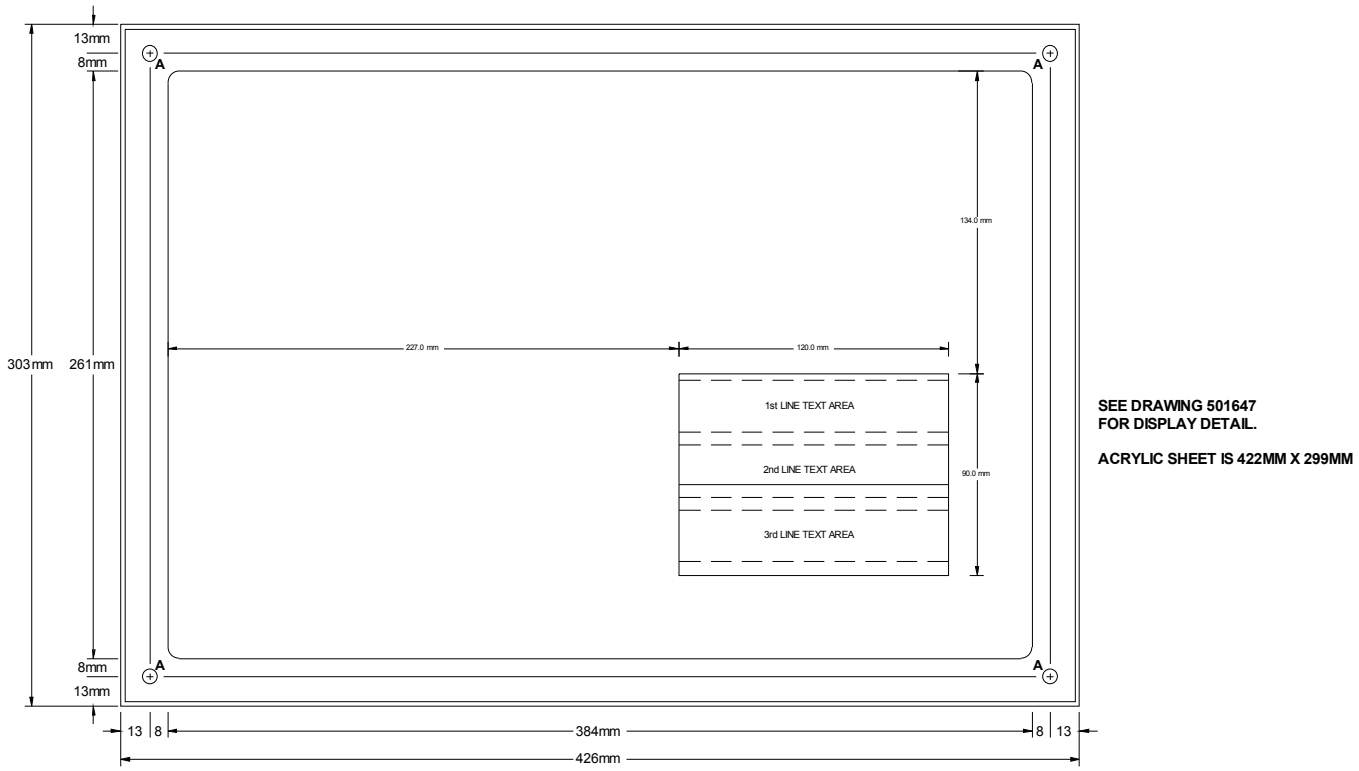
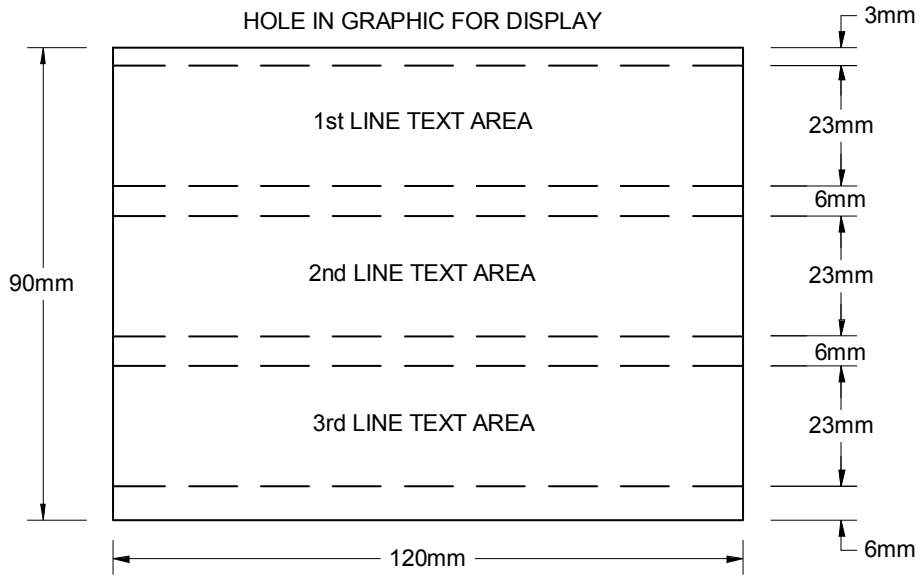
4.3. Power Generation Display Unit - 42 x 30cm (A3) – Graphic Design Detail (Overall)



4.4. Power Generation Display Unit - 42 x 30cm (A3) – Graphic Design Detail (Text)



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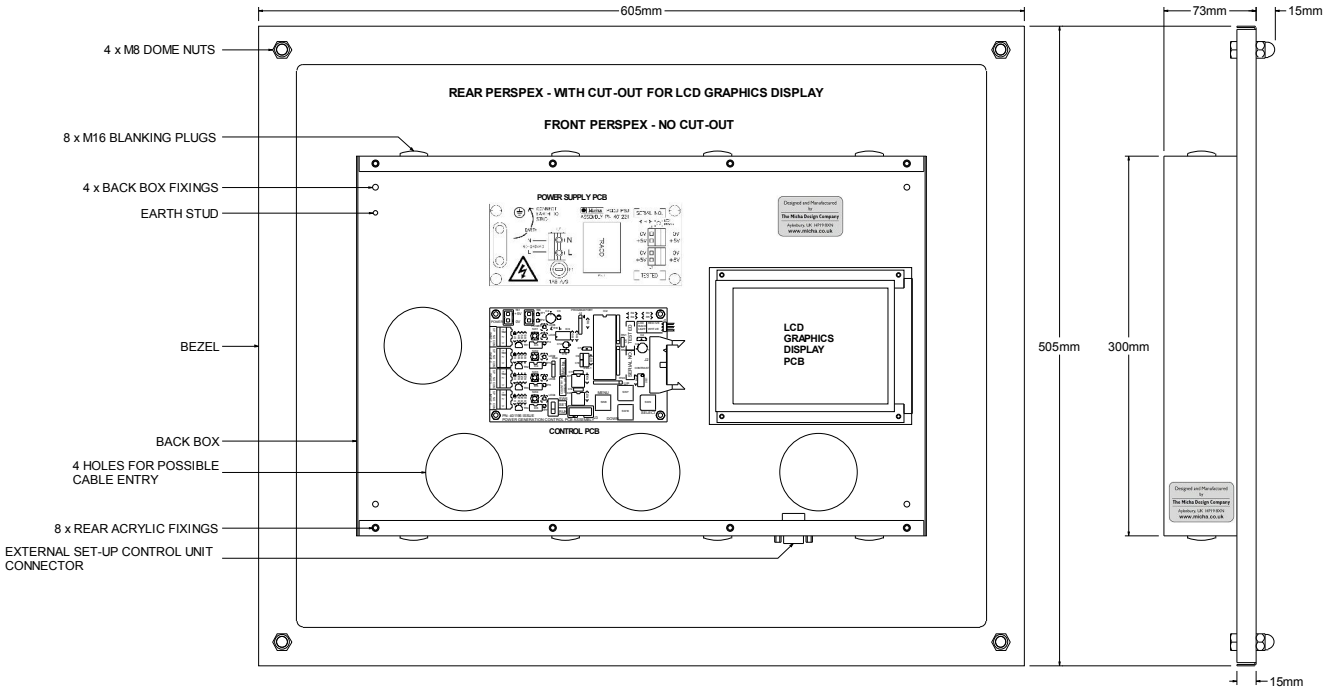
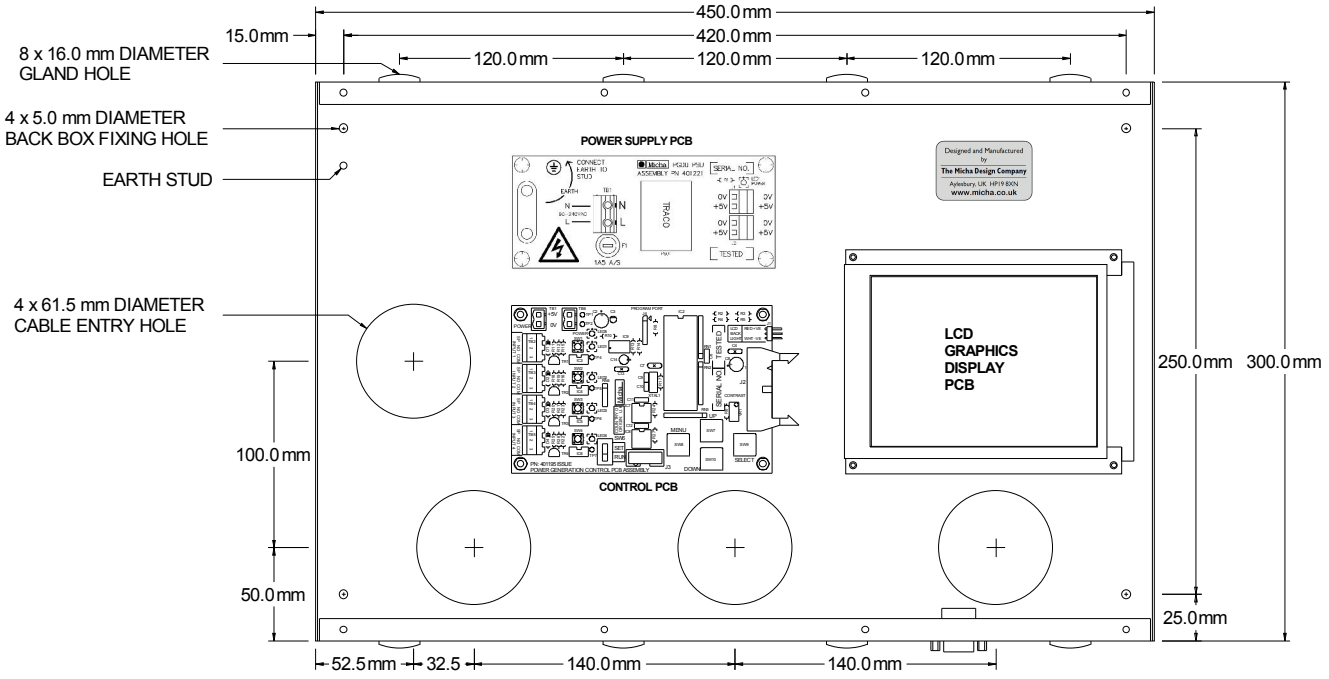
4.5. Power Generation Display Unit - 60 x 50cm – General Arrangement



4.6. Power Generation Display Unit - 60 x 50cm – Back Box Mounting Details



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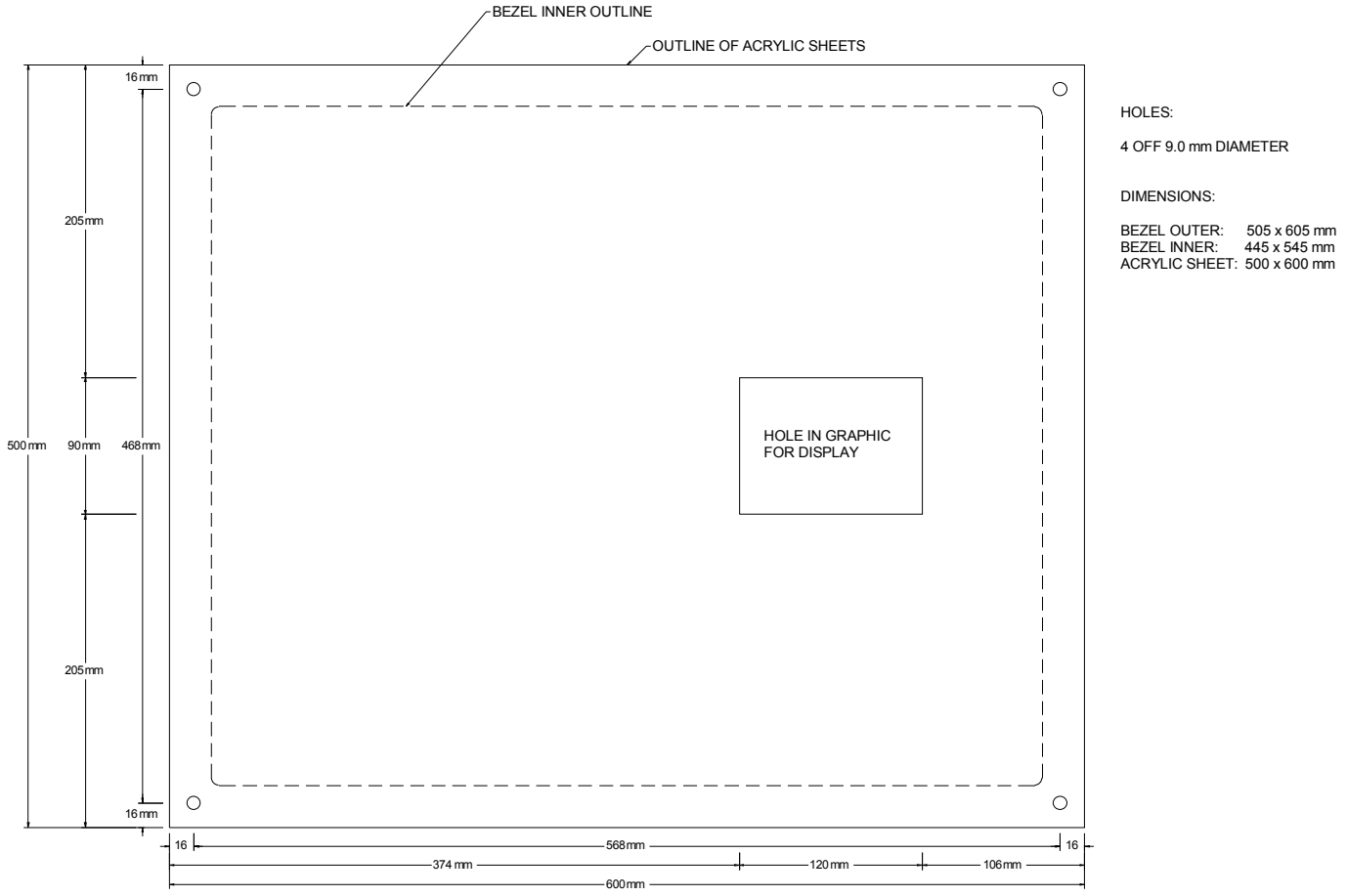
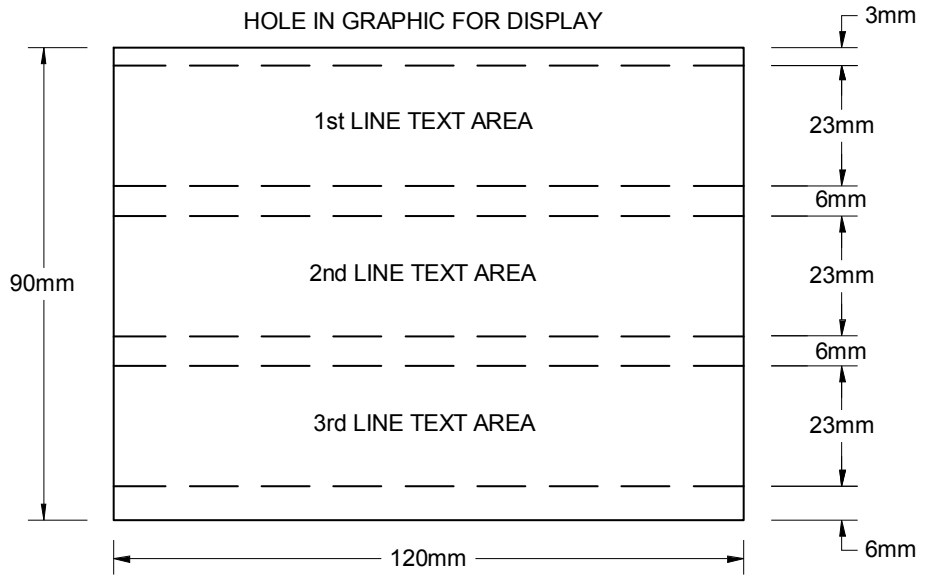
4.7. Power Generation Display Unit - 60 x 50cm – Graphic Design Details



4.8. Power Generation Display Unit - 60 x 50cm – Graphic Design Detail (Text)



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5. Software

5.1. Software History

Software Version	Date Released	Comments
801 264 Ver 1.0	22nd Aug 2006	First Production Software
801 264 Ver 1.1	23rd Aug 2007	Change CO2 factor from 0.43 to 0.568
801 264 Ver 1.2	9th Nov 2007	Modifications to Settings Screen Layout Refresh screen every 5 seconds
801 264 Ver 1.3	19th Nov 2007	Settings Screen: Pulse Value now adjustable from 1-9 units (For multiple building use – assuming all units producing same power)
801 264 Ver 1.4	24th June 2008	Default for Instant Power Update Time changed to 2 minutes
801 264 Ver 1.5	1st Oct 2009	Settings Screen: Pulse Value Units can now be adjusted from 1-40
801 264 Ver 1.6	11th April 2013	Added new Line 4 on Settings Menu as a reminder to the user "(Press SELECT to update Total Energy)"

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